

Results of Directional Survey

API number:	30-025-40517		
OGRID:		Operator:	YATES PETROLEUM CORPORATION
		Property:	MANGO BRM STATE # 1H

surface	ULSTR:	C	27	T 20S	R 35E
				100 FNL	2310 FWL

BH Loc	ULSTR:	N	27	T 20S	R 35E
15339	MD	10638.4	TVD	259 FSL	1807 FWL
				5021 FNL	

Top Perf/OH	ULSTR:	C	27	T 20S	R 35E
10914	MD	10622.0	TVD	603 FNL	2238 FWL

Bot Perf/OH	ULSTR:	N	27	T 20S	R 35E
15270	MD	10637.6	TVD	328 FSL	1933 FWL
				4952 FNL	

	MD	N/S	E/W	VD
	10888	-476.90	-71.00	10620
TOP PERFS/OH	10914	-502.82	-72.01	10622.01
	10919	-507.80	-72.20	10622.40
	15220	-4802.50	-285.00	10637.10
BOT PERFS/OH	15270	-4852.41	-376.70	10637.64
	15276	-4858.40	-387.70	10637.70

NEXT TO LAST	15220	-4802.50	-285.00	10637.10
LAST READING	15276	-4858.40	-387.70	10637.70
TD	15339	-4921.29	-503.24	10638.38

Surface Location	100	FN	2310	FW
Projected BHL	5021	FN	1807	FW
Location of				
Top Perfs/OH	603	FN	2238	FW
Bottom Perfs/OH	4952	FN	1933	FW

SUMMARY of Subsurface Locations

Surface Location	C-27-20S-35E	100	FN	2310	FW	Vert. Depth
Top Perfs/OH	C-27-20S-35E	603	FN	2238	FW	10622.01
Bottom Perfs/OH	N-27-20S-35E	4952	FN	1933	FW	10637.64
Projected TD	N-27-20S-35E	5021	FN	1807	FW	10638.38

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Yates Petroleum

Lea County, NM (NAD-83)

Mango BRM State

#1H

ST1

Design: ST1

Standard Survey Report

15 July, 2014

Survey Report

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Project	Lea County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Mango BRM State		
Site Position:		Northing:	565,378.04 usft
From:	Map	Easting:	814,670.73 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 33' 4.144 N
		Longitude:	103° 26' 46.489 W
		Grid Convergence:	0.48 °

Well	#1H		
Well Position	+N/-S	0.0 usft	Northing: 565,378.04 usft
	+E/-W	0.0 usft	Easting: 814,670.73 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Ground Level:	3,682.0 usft

Wellbore	ST1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	7/5/2014	7.17
			Dip Angle
			(°)
			60.43
			Field Strength
			(nT)
			48,518

Design	ST1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	9,950.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			183.32

Survey Program	Date 7/15/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
200.0	5,800.0	Survey #1 - Gyros (Pilot)	CB-GYRO-MS
5,921.0	9,950.0	Survey #2 - Crescent MWD Surveys (Pilot)	MWD
10,055.0	15,276.0	Survey #3 - Crescent MWD Surveys (ST1)	MWD
			Description
			Camera based gyro multishot
			MWD - Standard
			MWD - Standard

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(usft)	(usft)	Section	Rate	Rate	Rate	
(usft)			(usft)			(usft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	1.46	139.86	200.0	-1.9	1.6	1.8	0.73	0.73	0.00	
400.0	1.22	135.18	399.9	-5.4	4.8	5.1	0.13	-0.12	-2.34	
600.0	0.65	119.46	599.9	-7.5	7.3	7.0	0.31	-0.29	-7.86	
800.0	0.27	157.47	799.9	-8.5	8.4	8.0	0.23	-0.19	19.01	
1,000.0	0.35	203.38	999.9	-9.5	8.4	9.0	0.13	0.04	22.96	
1,200.0	0.28	98.70	1,199.9	-10.1	8.6	9.6	0.25	-0.04	-52.34	
1,400.0	0.31	16.02	1,399.9	-9.7	9.3	9.1	0.20	0.02	-41.34	
1,600.0	0.32	76.84	1,599.9	-9.0	9.9	8.4	0.16	0.01	30.41	

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Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,800.0	0.25	184.73	1,799.9	-9.3	10.5	8.7	0.23	-0.04	53.95
2,000.0	0.32	63.54	1,999.9	-9.5	10.9	8.9	0.25	0.04	-60.60
2,200.0	1.06	95.12	2,199.9	-9.4	13.3	8.6	0.40	0.37	15.79
2,400.0	0.95	102.03	2,399.8	-9.9	16.7	8.9	0.08	-0.06	3.46
2,600.0	1.15	88.16	2,599.8	-10.2	20.4	9.0	0.16	0.10	-6.94
2,800.0	1.26	92.94	2,799.8	-10.3	24.6	8.8	0.07	0.06	2.39
3,000.0	1.87	91.08	2,999.7	-10.4	30.0	8.7	0.31	0.31	-0.93
3,200.0	2.06	79.67	3,199.6	-9.8	36.8	7.7	0.22	0.10	-5.71
3,400.0	1.37	54.10	3,399.5	-7.8	42.3	5.3	0.51	-0.35	-12.79
3,600.0	0.95	55.42	3,599.4	-5.5	45.6	2.8	0.21	-0.21	0.66
3,800.0	0.96	75.44	3,799.4	-4.1	48.6	1.3	0.17	0.01	10.01
4,000.0	1.02	24.22	3,999.4	-2.0	50.9	-0.9	0.43	0.03	-25.61
4,200.0	1.04	27.30	4,199.3	1.2	52.5	-4.2	0.03	0.01	1.54
4,400.0	0.51	9.62	4,399.3	3.7	53.5	-6.8	0.29	-0.27	-8.84
4,600.0	0.75	349.29	4,599.3	5.8	53.4	-8.9	0.16	0.12	-10.17
4,800.0	0.76	354.07	4,799.3	8.4	53.0	-11.5	0.03	0.01	2.39
5,000.0	0.60	26.43	4,999.3	10.7	53.3	-13.8	0.20	-0.08	16.18
5,200.0	0.81	348.59	5,199.3	13.0	53.5	-16.1	0.25	0.11	-18.92
5,400.0	0.67	333.34	5,399.3	15.5	52.7	-18.5	0.12	-0.07	-7.63
5,600.0	0.67	330.83	5,599.2	17.5	51.6	-20.5	0.01	0.00	-1.26
5,800.0	0.36	5.68	5,799.2	19.2	51.1	-22.1	0.21	-0.16	17.43
5,921.0	0.50	50.80	5,920.2	19.9	51.6	-22.8	0.29	0.12	37.29
6,109.0	0.50	64.40	6,108.2	20.8	52.9	-23.8	0.06	0.00	7.23
6,296.0	0.70	76.00	6,295.2	21.4	54.8	-24.5	0.12	0.11	6.20
6,482.0	0.70	80.40	6,481.2	21.8	57.0	-25.1	0.03	0.00	2.37
6,669.0	0.90	250.90	6,668.2	21.6	56.7	-24.8	0.85	0.11	91.18
6,856.0	0.90	241.70	6,855.2	20.4	54.1	-23.5	0.08	0.00	-4.92
7,043.0	0.90	245.60	7,042.1	19.1	51.4	-22.0	0.03	0.00	2.09
7,231.0	0.90	225.90	7,230.1	17.4	49.0	-20.3	0.16	0.00	-10.48
7,417.0	0.90	239.10	7,416.1	15.7	46.7	-18.4	0.11	0.00	7.10
7,604.0	0.70	229.80	7,603.1	14.2	44.6	-16.7	0.13	-0.11	-4.97
7,791.0	0.90	209.90	7,790.1	12.2	43.0	-14.6	0.18	0.11	-10.64
7,977.0	0.90	231.50	7,976.0	10.0	41.1	-12.4	0.18	0.00	11.61
8,164.0	1.40	227.10	8,163.0	7.5	38.3	-9.7	0.27	0.27	-2.35
8,351.0	0.70	241.00	8,350.0	5.4	35.6	-7.5	0.40	-0.37	7.43
8,537.0	0.70	246.10	8,536.0	4.4	33.6	-6.3	0.03	0.00	2.74
8,724.0	0.40	205.50	8,722.9	3.4	32.3	-5.2	0.25	-0.16	-21.71
8,912.0	0.50	247.50	8,910.9	2.4	31.2	-4.3	0.18	0.05	22.34
9,099.0	0.70	214.50	9,097.9	1.2	29.8	-2.9	0.21	0.11	-17.65
9,286.0	0.50	255.10	9,284.9	0.0	28.4	-1.7	0.24	-0.11	21.71
9,471.0	0.50	225.40	9,469.9	-0.7	27.0	-0.8	0.14	0.00	-16.05
9,658.0	0.90	192.30	9,656.9	-2.7	26.1	1.2	0.30	0.21	-17.70
9,845.0	0.70	159.80	9,843.9	-5.2	26.2	3.7	0.26	-0.11	-17.38

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Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,950.0	0.50	31.80	9,948.9	-5.5	26.7	3.9	1.03	-0.19	-121.90
10,055.0	0.50	53.10	10,053.9	-4.8	27.3	3.2	0.18	0.00	20.29
10,082.0	0.40	48.90	10,080.9	-4.7	27.4	3.1	0.39	-0.37	-15.56
10,112.0	0.50	165.60	10,110.9	-4.7	27.6	3.1	2.56	0.33	389.00
KOP: 10112.0' MD, 10110.9' TVD									
10,143.0	2.80	188.10	10,141.9	-5.6	27.5	4.0	7.57	7.42	72.58
10,175.0	6.20	192.90	10,173.8	-8.1	27.0	6.5	10.68	10.63	15.00
10,206.0	9.50	195.70	10,204.5	-12.2	25.9	10.6	10.71	10.65	9.03
10,237.0	13.20	199.50	10,234.9	-18.0	24.0	16.5	12.17	11.94	12.26
10,268.0	17.20	202.20	10,264.8	-25.5	21.1	24.3	13.10	12.90	8.71
10,299.0	20.80	203.40	10,294.1	-34.8	17.2	33.8	11.68	11.61	3.87
10,330.0	24.60	202.90	10,322.7	-45.8	12.5	45.0	12.27	12.26	-1.61
10,361.0	28.20	201.80	10,350.4	-58.6	7.3	58.1	11.72	11.61	-3.55
10,392.0	31.70	200.80	10,377.3	-73.0	1.7	72.8	11.40	11.29	-3.23
10,423.0	35.90	199.90	10,403.0	-89.2	-4.3	89.3	13.64	13.55	-2.90
10,454.0	39.60	198.70	10,427.5	-107.1	-10.6	107.5	12.17	11.94	-3.87
10,485.0	42.40	196.90	10,450.9	-126.4	-16.8	127.2	9.80	9.03	-5.81
10,516.0	45.70	195.10	10,473.2	-147.2	-22.7	148.2	11.38	10.65	-5.81
10,548.0	49.80	193.20	10,494.7	-170.1	-28.5	171.5	13.54	12.81	-5.94
10,578.0	53.80	192.00	10,513.3	-193.1	-33.6	194.8	13.70	13.33	-4.00
10,610.0	57.40	191.30	10,531.4	-219.0	-39.0	220.9	11.39	11.25	-2.19
10,623.6	58.76	191.12	10,538.5	-230.3	-41.2	232.3	10.06	10.00	-1.31
Cross 330' Hardline: 10623.6' MD, 10538.5' TVD, 58.76° INC									
10,641.0	60.50	190.90	10,547.3	-245.0	-44.1	247.2	10.06	10.00	-1.27
10,672.0	63.00	190.40	10,562.0	-271.9	-49.1	274.3	8.19	8.06	-1.61
10,704.0	65.80	189.50	10,575.8	-300.3	-54.1	302.9	9.11	8.75	-2.81
10,735.0	68.80	188.50	10,587.8	-328.5	-58.6	331.4	10.12	9.68	-3.23
10,766.0	72.30	187.20	10,598.1	-357.5	-62.6	360.5	11.96	11.29	-4.19
10,797.0	76.50	185.50	10,606.5	-387.2	-65.9	390.3	14.54	13.55	-5.48
10,828.0	80.60	183.40	10,612.6	-417.4	-68.2	420.7	14.80	13.23	-6.77
10,857.0	82.90	182.70	10,616.8	-446.1	-69.7	449.4	8.28	7.93	-2.41
10,888.0	85.00	182.10	10,620.0	-476.9	-71.0	480.2	7.04	6.77	-1.94
10,919.0	86.20	182.10	10,622.4	-507.8	-72.2	511.1	3.87	3.87	0.00
10,950.0	88.70	181.80	10,623.8	-538.7	-73.2	542.1	8.12	8.06	-0.97
10,982.0	91.00	181.80	10,623.9	-570.7	-74.2	574.1	7.19	7.19	0.00
EOC: 10982.0' MD, 10623.9' TVD, 91.00° INC, 181.80° AZ, 574.1° VS									
11,075.0	92.00	182.50	10,621.4	-663.6	-77.7	667.0	1.31	1.08	0.75
11,168.0	89.70	182.30	10,620.1	-756.5	-81.6	760.0	2.48	-2.47	-0.22
11,261.0	90.30	182.50	10,620.1	-849.4	-85.5	853.0	0.68	0.65	0.22
11,354.0	90.30	183.40	10,619.6	-942.3	-90.3	946.0	0.97	0.00	0.97
11,448.0	90.30	183.90	10,619.1	-1,036.1	-96.3	1,040.0	0.53	0.00	0.53
11,541.0	90.10	182.10	10,618.8	-1,129.0	-101.1	1,133.0	1.95	-0.22	-1.94
11,635.0	90.40	182.10	10,618.4	-1,222.9	-104.6	1,226.9	0.32	0.32	0.00
11,728.0	90.30	182.10	10,617.8	-1,315.9	-108.0	1,319.9	0.11	-0.11	0.00

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11,822.0	90.30	182.70	10,617.3	-1,409.8	-111.9	1,413.9	0.64	0.00	0.64
11,915.0	90.40	182.80	10,616.7	-1,502.7	-116.4	1,506.9	0.15	0.11	0.11
12,009.0	90.40	183.00	10,616.1	-1,596.6	-121.1	1,600.9	0.21	0.00	0.21
12,103.0	90.60	183.20	10,615.2	-1,690.4	-126.2	1,694.9	0.30	0.21	0.21
12,197.0	89.90	181.60	10,614.8	-1,784.3	-130.2	1,788.9	1.86	-0.74	-1.70
12,290.0	90.40	181.60	10,614.6	-1,877.3	-132.8	1,881.8	0.54	0.54	0.00
12,383.0	90.40	181.30	10,613.9	-1,970.3	-135.1	1,974.8	0.32	0.00	-0.32
12,476.0	89.70	181.30	10,613.9	-2,063.2	-137.2	2,067.7	0.75	-0.75	0.00
12,570.0	89.00	181.80	10,614.9	-2,157.2	-139.8	2,161.7	0.92	-0.74	0.53
12,663.0	89.60	181.10	10,616.1	-2,250.1	-142.1	2,254.6	0.99	0.65	-0.75
12,756.0	90.10	181.30	10,616.3	-2,343.1	-144.1	2,347.5	0.58	0.54	0.22
12,849.0	90.10	181.80	10,616.1	-2,436.1	-146.6	2,440.5	0.54	0.00	0.54
12,942.0	90.60	182.10	10,615.6	-2,529.0	-149.7	2,533.5	0.63	0.54	0.32
13,036.0	90.80	182.50	10,614.4	-2,623.0	-153.5	2,627.4	0.48	0.21	0.43
13,129.0	90.40	182.80	10,613.5	-2,715.8	-157.8	2,720.4	0.54	-0.43	0.32
13,223.0	89.00	183.50	10,614.0	-2,809.7	-163.0	2,814.4	1.67	-1.49	0.74
13,317.0	88.70	183.40	10,615.8	-2,903.5	-168.6	2,908.4	0.34	-0.32	-0.11
13,411.0	88.30	183.20	10,618.3	-2,997.3	-174.0	3,002.4	0.48	-0.43	-0.21
13,505.0	88.00	183.50	10,621.3	-3,091.1	-179.5	3,096.3	0.45	-0.32	0.32
13,598.0	88.00	183.50	10,624.6	-3,183.9	-185.2	3,189.3	0.00	0.00	0.00
13,692.0	89.40	184.10	10,626.7	-3,277.7	-191.4	3,283.2	1.62	1.49	0.64
13,785.0	89.40	184.60	10,627.7	-3,370.4	-198.5	3,376.2	0.54	0.00	0.54
13,878.0	89.60	184.40	10,628.5	-3,463.1	-205.8	3,469.2	0.30	0.22	-0.22
13,972.0	89.60	184.80	10,629.2	-3,556.8	-213.3	3,563.2	0.43	0.00	0.43
14,065.0	89.20	185.30	10,630.1	-3,649.4	-221.5	3,656.1	0.69	-0.43	0.54
14,158.0	89.00	184.10	10,631.6	-3,742.1	-229.1	3,749.1	1.31	-0.22	-1.29
14,252.0	89.40	183.90	10,632.9	-3,835.9	-235.7	3,843.1	0.48	0.43	-0.21
14,346.0	89.90	184.10	10,633.5	-3,929.6	-242.2	3,937.1	0.57	0.53	0.21
14,440.0	89.90	183.90	10,633.6	-4,023.4	-248.8	4,031.0	0.21	0.00	-0.21
14,534.0	89.70	182.80	10,634.0	-4,117.2	-254.3	4,125.0	1.19	-0.21	-1.17
14,628.0	90.10	182.10	10,634.1	-4,211.1	-258.3	4,219.0	0.86	0.43	-0.74
14,722.0	90.10	182.80	10,634.0	-4,305.1	-262.3	4,313.0	0.74	0.00	0.74
14,815.0	90.30	183.40	10,633.6	-4,397.9	-267.4	4,406.0	0.68	0.22	0.65
14,909.0	89.40	182.10	10,633.9	-4,491.8	-271.9	4,500.0	1.68	-0.96	-1.38
15,003.0	89.40	182.50	10,634.9	-4,585.7	-275.6	4,594.0	0.43	0.00	0.43
15,096.0	89.40	182.30	10,635.8	-4,678.6	-279.5	4,687.0	0.22	0.00	-0.22
15,189.0	89.40	182.70	10,636.8	-4,771.5	-283.6	4,780.0	0.43	0.00	0.43
15,220.0	89.40	182.70	10,637.1	-4,802.5	-285.0	4,811.0	0.00	0.00	0.00
Final MWD Survey: 15220.0' MD, 10637.1' TVD, -4802.5' +N/-S, -285.0' +E/-W									
15,276.0	89.40	182.70	10,637.7	-4,858.4	-287.7	4,867.0	0.00	0.00	0.00
BHL: 15276.0' MD, 10637.7' TVD, 89.40° INC, 182.70° AZ, -4858.4' +N/-S, -287.7' +E/-W, 4867.0' VS - TD: 15276.0' MD, 10637.7' TVD									

Survey Report

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
10,112.0	10,110.9	-4.7	27.6	KOP: 10112.0' MD, 10110.9' TVD
10,623.6	10,538.5	-230.3	-41.2	Cross 330' Hardline:10623.6' MD, 10538.5' TVD, 58.76° INC
10,982.0	10,623.9	-570.7	-74.2	EOC: 10982.0' MD, 10623.9' TVD, 91.00° INC, 181.80° AZ, 574.1' VS
15,220.0	10,637.1	-4,802.5	-285.0	Final MWD Survey: 15220.0' MD, 10637.1' TVD, -4802.5' +N/-S, -285.0' +E/-W
15,276.0	10,637.7	-4,858.4	-287.7	BHL: 15276.0' MD, 10637.7' TVD, 89.40° INC, 182.70° AZ, -4858.4' +N/-S, -287
15,276.0	10,637.7	-4,858.4	-287.7	TD: 15276.0' MD, 10637.7' TVD

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------



Yates Petroleum
Project: Lea County, NM (NAD-83)
Site: Mango BRM State
Well: #1H
Wellbore: ST1
Plan: ST1 - Plan #4 (#1H/ST1)

WELL DETAILS: #1H

Ground Elevation:: 3682.0
RKB Elevation: RKB @ 3703.5usft (Nomac #22 KB=21.5')
Rig Name: Nomac #22 KB=21.5'

Surface Hole Location
Northing 565378.04 Easting 814670.73 Latitude 32° 33' 4.144 N Longitude 103° 26' 46.489 W

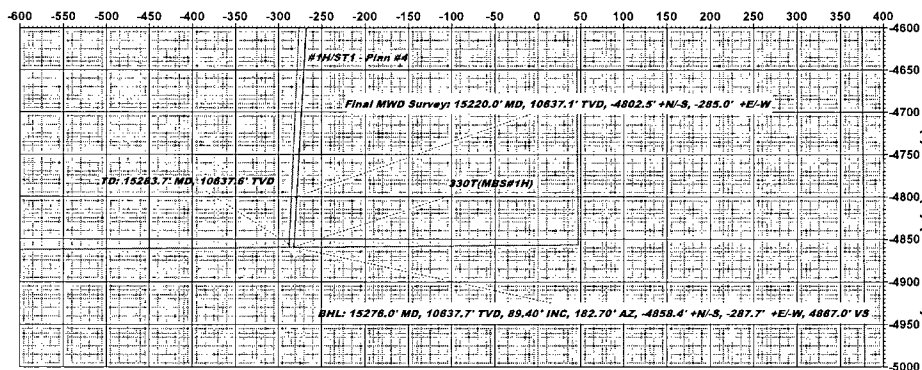


Azimuths to Grid North
True North: -0.48°
Magnetic North: 6.70°
Magnetic Field
Strength: 48518.5nT
Dip Angle: 60.43°
Date: 7/5/2014
Model: IGRF2010

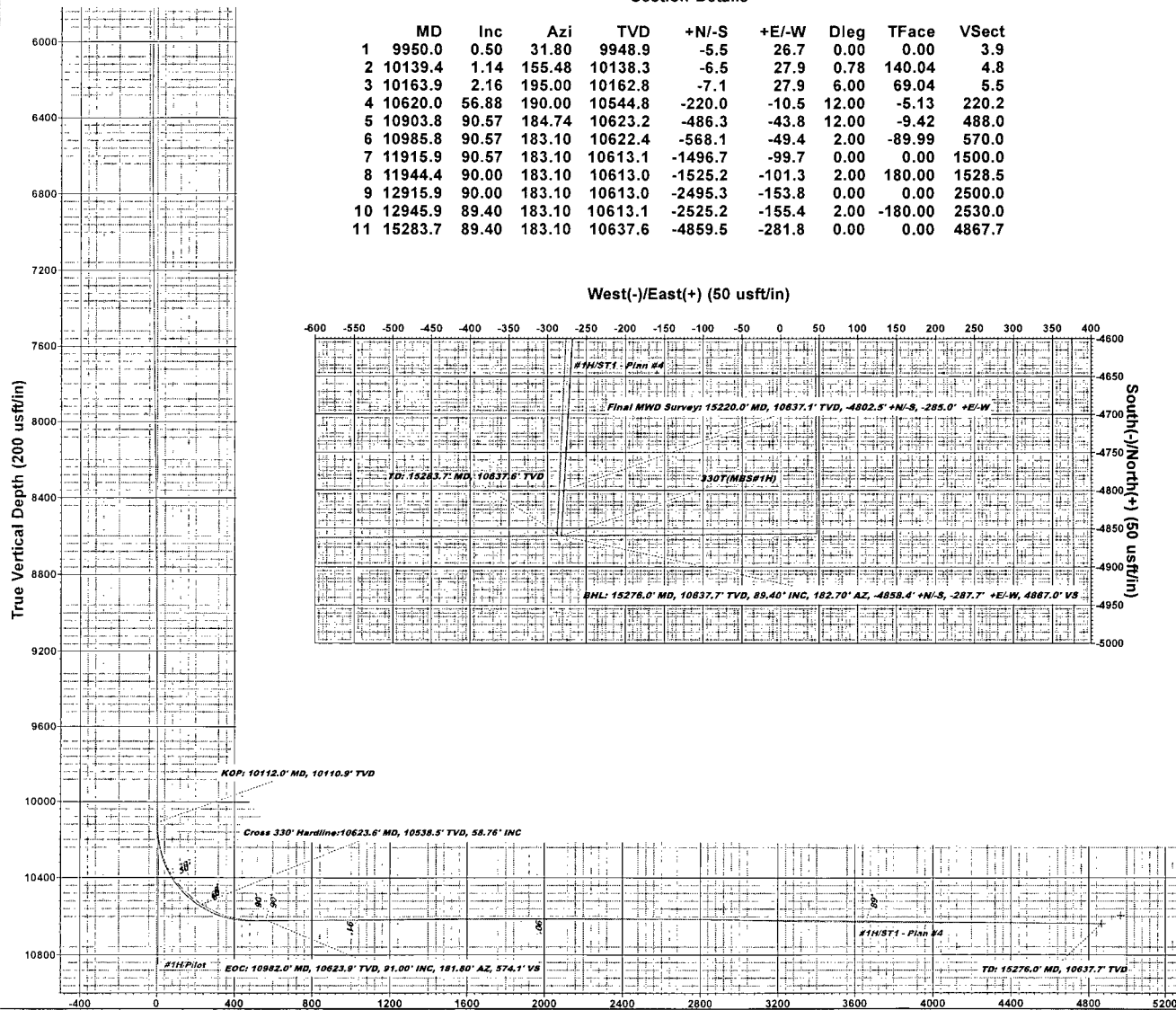
Section Details

	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	9950.0	0.50	31.80	9948.9	-5.5	26.7	0.00	0.00	3.9
2	10139.4	1.14	155.48	10138.3	-6.5	27.9	0.78	140.04	4.8
3	10163.9	2.16	195.00	10162.8	-7.1	27.9	6.00	69.04	5.5
4	10620.0	56.88	190.00	10544.8	-220.0	-10.5	12.00	-5.13	220.2
5	10903.8	90.57	184.74	10623.2	-486.3	-43.8	12.00	-9.42	488.0
6	10985.8	90.57	183.10	10622.4	-568.1	-49.4	2.00	-89.99	570.0
7	11915.9	90.57	183.10	10613.1	-1496.7	-99.7	0.00	0.00	1500.0
8	11944.4	90.00	183.10	10613.0	-1525.2	-101.3	2.00	180.00	1528.5
9	12915.9	90.00	183.10	10613.0	-2495.3	-153.8	0.00	0.00	2500.0
10	12945.9	89.40	183.10	10613.1	-2525.2	-155.4	2.00	-180.00	2530.0
11	15283.7	89.40	183.10	10637.6	-4859.5	-281.8	0.00	0.00	4867.7

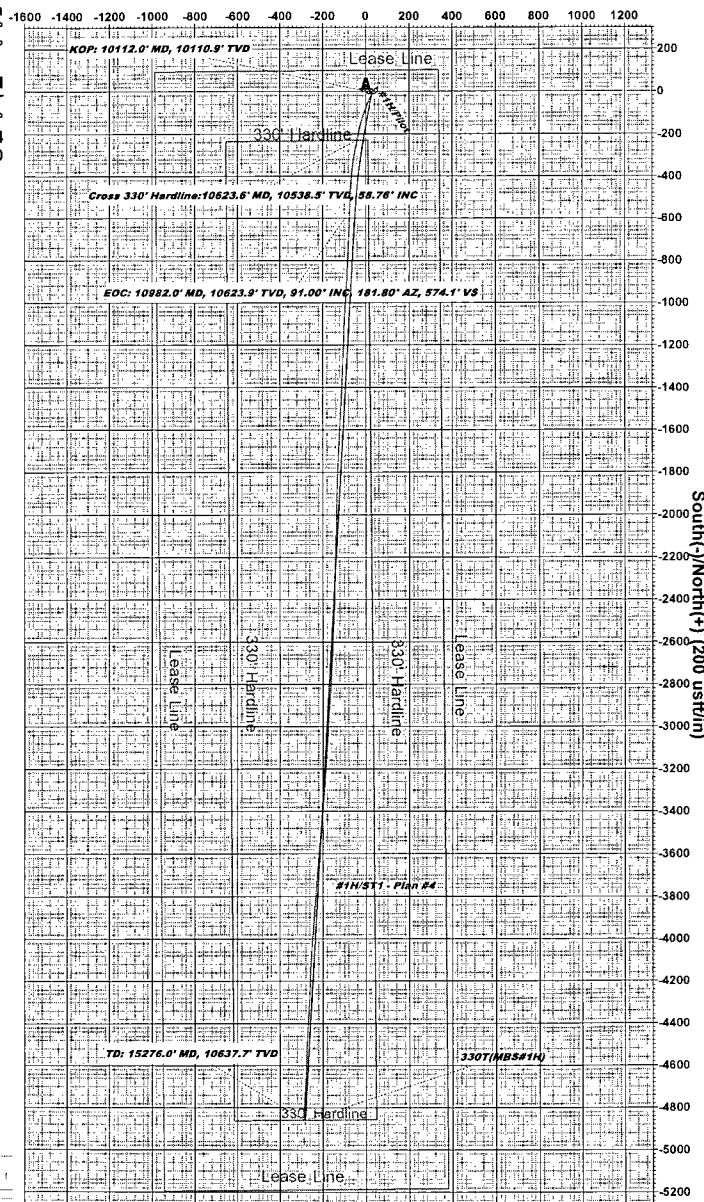
West(-)/East(+) (50 usft/in)



Vertical Section at 183.32° (200 usft/in)



West(-)/East(+) (200 usft/in)



PROJECT DETAILS: Lea County, NM (NAD-83)
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid

Plan: ST1 - Plan #4 (#1H/ST1)
Created By: Adrian Castro Date: 7:45, July 15 2014



Crescent Directional Drilling
7715 West Industrial Ave. Midland, Tx 79706
Phone: 432-618-1135

HOBBS OGD

NOV 04 2014

RECEIVED

Yates Petroleum

Lea County, NM (NAD-83)

Mango BRM State

#1H

ST1

Design: ST1

Survey Report - Geographic

15 July, 2014

Survey Report - Geographic

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Project	Lea County, NM (NAD-83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Mango BRM State		
Site Position:		Northing:	565,378.04 usft
From:	Map	Easting:	814,670.73 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 33' 4.144 N
		Longitude:	103° 26' 46.489 W
		Grid Convergence:	0.48 °

Well	#1H		
Well Position	+N/-S	0.0 usft	Northing: 565,378.04 usft
	+E/-W	0.0 usft	Easting: 814,670.73 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft
		Ground Level:	3,682.0 usft

Wellbore	ST1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010	7/5/2014	7.17
			Dip Angle
			(°)
			60.43
			Field Strength
			(nT)
			48,518

Design	ST1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	9,950.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			(°)
			183.32

Survey Program	Date 7/15/2014		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
200.0	5,800.0	Survey #1 - Gyros (Pilot)	CB-GYRO-MS
5,921.0	9,950.0	Survey #2 - Crescent MWD Surveys (Pilot)	MWD
10,055.0	15,276.0	Survey #3 - Crescent MWD Surveys (ST1)	MWD
			Description
			Camera based gyro multishot
			MWD - Standard
			MWD - Standard

Survey									
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Map	Map	Latitude	Longitude
Depth	(°)	(°)	Depth	(usft)	(usft)	Northing	Easting		
(usft)			(usft)			(usft)	(usft)		
0.0	0.00	0.00	0.0	0.0	0.0	565,378.04	814,670.73	32° 33' 4.144 N	103° 26' 46.489 W
200.0	1.46	139.86	200.0	-1.9	1.6	565,376.09	814,672.37	32° 33' 4.125 N	103° 26' 46.470 W
400.0	1.22	135.18	399.9	-5.4	4.8	565,372.63	814,675.51	32° 33' 4.090 N	103° 26' 46.433 W
600.0	0.65	119.46	599.9	-7.5	7.3	565,370.56	814,678.00	32° 33' 4.070 N	103° 26' 46.404 W
800.0	0.27	157.47	799.9	-8.5	8.4	565,369.57	814,679.17	32° 33' 4.060 N	103° 26' 46.391 W
1,000.0	0.35	203.38	999.9	-9.5	8.4	565,368.57	814,679.11	32° 33' 4.050 N	103° 26' 46.392 W
1,200.0	0.28	98.70	1,199.9	-10.1	8.6	565,367.94	814,679.35	32° 33' 4.044 N	103° 26' 46.389 W
1,400.0	0.31	16.02	1,399.9	-9.7	9.3	565,368.39	814,679.98	32° 33' 4.048 N	103° 26' 46.381 W
1,600.0	0.32	76.84	1,599.9	-9.0	9.9	565,369.03	814,680.67	32° 33' 4.054 N	103° 26' 46.373 W
1,800.0	0.25	184.73	1,799.9	-9.3	10.5	565,368.73	814,681.18	32° 33' 4.051 N	103° 26' 46.367 W

Survey Report - Geographic

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango, BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
2,000.0	0.32	63.54	1,999.9	-9.5	10.9	565,368.54	814,681.65	32° 33' 4.049 N	103° 26' 46.362 W	
2,200.0	1.06	95.12	2,199.9	-9.4	13.3	565,368.62	814,683.99	32° 33' 4.050 N	103° 26' 46.334 W	
2,400.0	0.95	102.03	2,399.8	-9.9	16.7	565,368.11	814,687.45	32° 33' 4.045 N	103° 26' 46.294 W	
2,600.0	1.15	88.16	2,599.8	-10.2	20.4	565,367.83	814,691.08	32° 33' 4.042 N	103° 26' 46.252 W	
2,800.0	1.26	92.94	2,799.8	-10.3	24.6	565,367.78	814,695.28	32° 33' 4.041 N	103° 26' 46.203 W	
3,000.0	1.87	91.08	2,999.7	-10.4	30.0	565,367.61	814,700.74	32° 33' 4.039 N	103° 26' 46.139 W	
3,200.0	2.06	79.67	3,199.6	-9.8	36.8	565,368.19	814,707.54	32° 33' 4.044 N	103° 26' 46.059 W	
3,400.0	1.37	54.10	3,399.5	-7.8	42.3	565,370.24	814,713.01	32° 33' 4.064 N	103° 26' 45.995 W	
3,600.0	0.95	55.42	3,599.4	-5.5	45.6	565,372.58	814,716.32	32° 33' 4.087 N	103° 26' 45.956 W	
3,800.0	0.96	75.44	3,799.4	-4.1	48.6	565,373.94	814,719.30	32° 33' 4.100 N	103° 26' 45.921 W	
4,000.0	1.02	24.22	3,999.4	-2.0	50.9	565,375.99	814,721.65	32° 33' 4.120 N	103° 26' 45.894 W	
4,200.0	1.04	27.30	4,199.3	1.2	52.5	565,379.22	814,723.22	32° 33' 4.152 N	103° 26' 45.875 W	
4,400.0	0.51	9.62	4,399.3	3.7	53.5	565,381.71	814,724.20	32° 33' 4.176 N	103° 26' 45.863 W	
4,600.0	0.75	349.29	4,599.3	5.8	53.4	565,383.88	814,724.10	32° 33' 4.198 N	103° 26' 45.864 W	
4,800.0	0.76	354.07	4,799.3	8.4	53.0	565,386.48	814,723.72	32° 33' 4.224 N	103° 26' 45.869 W	
5,000.0	0.60	26.43	4,999.3	10.7	53.3	565,388.74	814,724.05	32° 33' 4.246 N	103° 26' 45.865 W	
5,200.0	0.81	348.59	5,199.3	13.0	53.5	565,391.06	814,724.24	32° 33' 4.269 N	103° 26' 45.862 W	
5,400.0	0.67	333.34	5,399.3	15.5	52.7	565,393.50	814,723.43	32° 33' 4.293 N	103° 26' 45.871 W	
5,600.0	0.67	330.83	5,599.2	17.5	51.6	565,395.56	814,722.34	32° 33' 4.313 N	103° 26' 45.884 W	
5,800.0	0.36	5.68	5,799.2	19.2	51.1	565,397.21	814,721.83	32° 33' 4.330 N	103° 26' 45.890 W	
5,921.0	0.50	50.80	5,920.2	19.9	51.6	565,397.92	814,722.28	32° 33' 4.337 N	103° 26' 45.884 W	
6,109.0	0.50	64.40	6,108.2	20.8	52.9	565,398.79	814,723.65	32° 33' 4.345 N	103° 26' 45.868 W	
6,296.0	0.70	76.00	6,295.2	21.4	54.8	565,399.42	814,725.50	32° 33' 4.351 N	103° 26' 45.847 W	
6,482.0	0.70	80.40	6,481.2	21.8	57.0	565,399.89	814,727.72	32° 33' 4.356 N	103° 26' 45.821 W	
6,669.0	0.90	250.90	6,668.2	21.6	56.7	565,399.60	814,727.46	32° 33' 4.353 N	103° 26' 45.824 W	
6,856.0	0.90	241.70	6,855.2	20.4	54.1	565,398.42	814,724.78	32° 33' 4.342 N	103° 26' 45.855 W	
7,043.0	0.90	245.60	7,042.1	19.1	51.4	565,397.12	814,722.15	32° 33' 4.329 N	103° 26' 45.886 W	
7,231.0	0.90	225.90	7,230.1	17.4	49.0	565,395.48	814,719.74	32° 33' 4.313 N	103° 26' 45.914 W	
7,417.0	0.90	239.10	7,416.1	15.7	46.7	565,393.71	814,717.44	32° 33' 4.296 N	103° 26' 45.941 W	
7,604.0	0.70	229.80	7,603.1	14.2	44.6	565,392.22	814,715.31	32° 33' 4.281 N	103° 26' 45.966 W	
7,791.0	0.90	209.90	7,790.1	12.2	43.0	565,390.21	814,713.70	32° 33' 4.261 N	103° 26' 45.985 W	
7,977.0	0.90	231.50	7,976.0	10.0	41.1	565,388.03	814,711.83	32° 33' 4.240 N	103° 26' 46.007 W	
8,164.0	1.40	227.10	8,163.0	7.5	38.3	565,385.56	814,709.01	32° 33' 4.216 N	103° 26' 46.041 W	
8,351.0	0.70	241.00	8,350.0	5.4	35.6	565,383.46	814,706.34	32° 33' 4.195 N	103° 26' 46.072 W	
8,537.0	0.70	246.10	8,536.0	4.4	33.6	565,382.44	814,704.30	32° 33' 4.185 N	103° 26' 46.096 W	
8,724.0	0.40	205.50	8,722.9	3.4	32.3	565,381.39	814,702.98	32° 33' 4.175 N	103° 26' 46.111 W	
8,912.0	0.50	247.50	8,910.9	2.4	31.2	565,380.49	814,701.94	32° 33' 4.166 N	103° 26' 46.124 W	
9,099.0	0.70	214.50	9,097.9	1.2	29.8	565,379.23	814,700.54	32° 33' 4.154 N	103° 26' 46.140 W	
9,286.0	0.50	255.10	9,284.9	0.0	28.4	565,378.08	814,699.10	32° 33' 4.142 N	103° 26' 46.157 W	
9,471.0	0.50	225.40	9,469.9	-0.7	27.0	565,377.31	814,697.75	32° 33' 4.135 N	103° 26' 46.173 W	
9,658.0	0.90	192.30	9,656.9	-2.7	26.1	565,375.30	814,696.85	32° 33' 4.115 N	103° 26' 46.184 W	
9,845.0	0.70	159.80	9,843.9	-5.2	26.2	565,372.79	814,696.94	32° 33' 4.090 N	103° 26' 46.183 W	
9,950.0	0.50	31.80	9,948.9	-5.5	26.7	565,372.58	814,697.40	32° 33' 4.088 N	103° 26' 46.177 W	
10,055.0	0.50	53.10	10,053.9	-4.8	27.3	565,373.24	814,698.01	32° 33' 4.095 N	103° 26' 46.170 W	
10,082.0	0.40	48.90	10,080.9	-4.7	27.4	565,373.38	814,698.17	32° 33' 4.096 N	103° 26' 46.168 W	
10,112.0	0.50	165.60	10,110.9	-4.7	27.6	565,373.32	814,698.28	32° 33' 4.095 N	103° 26' 46.167 W	
KOP: 10112.0' MD, 10110.9' TVD										
10,143.0	2.80	188.10	10,141.9	-5.6	27.5	565,372.44	814,698.21	32° 33' 4.087 N	103° 26' 46.168 W	
10,175.0	6.20	192.90	10,173.8	-8.1	27.0	565,369.98	814,697.71	32° 33' 4.062 N	103° 26' 46.174 W	
10,206.0	9.50	195.70	10,204.5	-12.2	25.9	565,365.88	814,696.65	32° 33' 4.022 N	103° 26' 46.187 W	
10,237.0	13.20	199.50	10,234.9	-18.0	24.0	565,360.08	814,694.77	32° 33' 3.965 N	103° 26' 46.209 W	
10,268.0	17.20	202.20	10,264.8	-25.5	21.1	565,352.50	814,691.86	32° 33' 3.890 N	103° 26' 46.244 W	
10,299.0	20.80	203.40	10,294.1	-34.8	17.2	565,343.20	814,687.94	32° 33' 3.798 N	103° 26' 46.291 W	
10,330.0	24.60	202.90	10,322.7	-45.8	12.5	565,332.20	814,683.24	32° 33' 3.690 N	103° 26' 46.347 W	
10,361.0	28.20	201.80	10,350.4	-58.6	7.3	565,319.45	814,678.01	32° 33' 3.564 N	103° 26' 46.409 W	

Survey Report - Geographic

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,392.0	31.70	200.80	10,377.3	-73.0	1.7	565,305.03	814,672.39	32° 33' 3.422 N	103° 26' 46.476 W
10,423.0	35.90	199.90	10,403.0	-89.2	-4.3	565,288.87	814,666.41	32° 33' 3.262 N	103° 26' 46.548 W
10,454.0	39.60	198.70	10,427.5	-107.1	-10.6	565,270.96	814,660.14	32° 33' 3.086 N	103° 26' 46.623 W
10,485.0	42.40	196.90	10,450.9	-126.4	-16.8	565,251.59	814,653.93	32° 33' 2.895 N	103° 26' 46.697 W
10,516.0	45.70	195.10	10,473.2	-147.2	-22.7	565,230.87	814,648.00	32° 33' 2.690 N	103° 26' 46.768 W
10,548.0	49.80	193.20	10,494.7	-170.1	-28.5	565,207.91	814,642.23	32° 33' 2.463 N	103° 26' 46.838 W
10,578.0	53.80	192.00	10,513.3	-193.1	-33.6	565,184.91	814,637.09	32° 33' 2.236 N	103° 26' 46.900 W
10,610.0	57.40	191.30	10,531.4	-219.0	-39.0	565,159.05	814,631.77	32° 33' 1.981 N	103° 26' 46.965 W
10,623.6	58.76	191.12	10,538.5	-230.3	-41.2	565,147.73	814,629.52	32° 33' 1.869 N	103° 26' 46.992 W
Cross 330' Hardline: 10623.6' MD, 10538.5' TVD, 58.76° INC									
10,641.0	60.50	190.90	10,547.3	-245.0	-44.1	565,132.99	814,626.65	32° 33' 1.723 N	103° 26' 47.027 W
10,672.0	63.00	190.40	10,562.0	-271.9	-49.1	565,106.16	814,621.61	32° 33' 1.458 N	103° 26' 47.089 W
10,704.0	65.80	189.50	10,575.8	-300.3	-54.1	565,077.73	814,616.63	32° 33' 1.177 N	103° 26' 47.150 W
10,735.0	68.80	188.50	10,587.8	-328.5	-58.6	565,049.49	814,612.16	32° 33' 0.898 N	103° 26' 47.205 W
10,766.0	72.30	187.20	10,598.1	-357.5	-62.6	565,020.54	814,608.17	32° 33' 0.612 N	103° 26' 47.254 W
10,797.0	76.50	185.50	10,606.5	-387.2	-65.9	564,990.87	814,604.87	32° 33' 0.319 N	103° 26' 47.296 W
10,828.0	80.60	183.40	10,612.6	-417.4	-68.2	564,960.59	814,602.52	32° 33' 0.020 N	103° 26' 47.326 W
10,857.0	82.90	182.70	10,616.8	-446.1	-69.7	564,931.93	814,600.99	32° 32' 59.736 N	103° 26' 47.347 W
10,888.0	85.00	182.10	10,620.0	-476.9	-71.0	564,901.13	814,599.70	32° 32' 59.432 N	103° 26' 47.365 W
10,919.0	86.20	182.10	10,622.4	-507.8	-72.2	564,870.25	814,598.57	32° 32' 59.126 N	103° 26' 47.381 W
10,950.0	88.70	181.80	10,623.8	-538.7	-73.2	564,839.30	814,597.51	32° 32' 58.820 N	103° 26' 47.396 W
10,982.0	91.00	181.80	10,623.9	-570.7	-74.2	564,807.31	814,596.51	32° 32' 58.504 N	103° 26' 47.411 W
EOC: 10982.0' MD, 10623.9' TVD, 91.00° INC, 181.80° AZ, 574.1' VS									
11,075.0	92.00	182.50	10,621.4	-663.6	-77.7	564,714.41	814,593.02	32° 32' 57.585 N	103° 26' 47.461 W
11,168.0	89.70	182.30	10,620.1	-756.5	-81.6	564,621.51	814,589.13	32° 32' 56.666 N	103° 26' 47.515 W
11,261.0	90.30	182.50	10,620.1	-849.4	-85.5	564,528.59	814,585.23	32° 32' 55.747 N	103° 26' 47.570 W
11,354.0	90.30	183.40	10,619.6	-942.3	-90.3	564,435.72	814,580.45	32° 32' 54.828 N	103° 26' 47.635 W
11,448.0	90.30	183.90	10,619.1	-1,036.1	-96.3	564,341.91	814,574.46	32° 32' 53.900 N	103° 26' 47.714 W
11,541.0	90.10	182.10	10,618.8	-1,129.0	-101.1	564,249.04	814,569.60	32° 32' 52.982 N	103° 26' 47.780 W
11,635.0	90.40	182.10	10,618.4	-1,222.9	-104.6	564,155.11	814,566.15	32° 32' 52.053 N	103° 26' 47.829 W
11,728.0	90.30	182.10	10,617.8	-1,315.9	-108.0	564,062.17	814,562.74	32° 32' 51.134 N	103° 26' 47.878 W
11,822.0	90.30	182.70	10,617.3	-1,409.8	-111.9	563,968.26	814,558.81	32° 32' 50.205 N	103° 26' 47.933 W
11,915.0	90.40	182.80	10,616.7	-1,502.7	-116.4	563,875.36	814,554.35	32° 32' 49.286 N	103° 26' 47.994 W
12,009.0	90.40	183.00	10,616.1	-1,596.6	-121.1	563,781.49	814,549.59	32° 32' 48.357 N	103° 26' 48.059 W
12,103.0	90.60	183.20	10,615.2	-1,690.4	-126.2	563,687.63	814,544.51	32° 32' 47.429 N	103° 26' 48.127 W
12,197.0	89.90	181.60	10,614.8	-1,784.3	-130.2	563,593.72	814,540.57	32° 32' 46.500 N	103° 26' 48.183 W
12,290.0	90.40	181.60	10,614.6	-1,877.3	-132.8	563,500.75	814,537.97	32° 32' 45.581 N	103° 26' 48.222 W
12,383.0	90.40	181.30	10,613.9	-1,970.3	-135.1	563,407.78	814,535.62	32° 32' 44.661 N	103° 26' 48.259 W
12,476.0	89.70	181.30	10,613.9	-2,063.2	-137.2	563,314.81	814,533.51	32° 32' 43.741 N	103° 26' 48.292 W
12,570.0	89.00	181.80	10,614.9	-2,157.2	-139.8	563,220.85	814,530.97	32° 32' 42.812 N	103° 26' 48.331 W
12,663.0	89.60	181.10	10,616.1	-2,250.1	-142.1	563,127.89	814,528.62	32° 32' 41.892 N	103° 26' 48.368 W
12,756.0	90.10	181.30	10,616.3	-2,343.1	-144.1	563,034.91	814,526.67	32° 32' 40.972 N	103° 26' 48.399 W
12,849.0	90.10	181.80	10,616.1	-2,436.1	-146.6	562,941.94	814,524.15	32° 32' 40.053 N	103° 26' 48.438 W
12,942.0	90.60	182.10	10,615.6	-2,529.0	-149.7	562,849.00	814,520.99	32° 32' 39.133 N	103° 26' 48.484 W
13,036.0	90.80	182.50	10,614.4	-2,623.0	-153.5	562,755.08	814,517.22	32° 32' 38.204 N	103° 26' 48.537 W
13,129.0	90.40	182.80	10,613.5	-2,715.8	-157.8	562,662.19	814,512.92	32° 32' 37.286 N	103° 26' 48.596 W
13,223.0	89.00	183.50	10,614.0	-2,809.7	-163.0	562,568.33	814,507.75	32° 32' 36.358 N	103° 26' 48.666 W
13,317.0	88.70	183.40	10,615.8	-2,903.5	-168.6	562,474.52	814,502.10	32° 32' 35.430 N	103° 26' 48.741 W
13,411.0	88.30	183.20	10,618.3	-2,997.3	-174.0	562,380.71	814,496.69	32° 32' 34.502 N	103° 26' 48.813 W
13,505.0	88.00	183.50	10,621.3	-3,091.1	-179.5	562,286.92	814,491.20	32° 32' 33.574 N	103° 26' 48.886 W
13,598.0	88.00	183.50	10,624.6	-3,183.9	-185.2	562,194.15	814,485.52	32° 32' 32.657 N	103° 26' 48.962 W
13,692.0	89.40	184.10	10,626.7	-3,277.7	-191.4	562,100.38	814,479.29	32° 32' 31.730 N	103° 26' 49.044 W
13,785.0	89.40	184.60	10,627.7	-3,370.4	-198.5	562,007.66	814,472.24	32° 32' 30.813 N	103° 26' 49.135 W
13,878.0	89.60	184.40	10,628.5	-3,463.1	-205.8	561,914.95	814,464.94	32° 32' 29.896 N	103° 26' 49.229 W
13,972.0	89.60	184.80	10,629.2	-3,556.8	-213.3	561,821.25	814,457.41	32° 32' 28.970 N	103° 26' 49.326 W

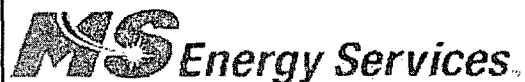
Survey Report - Geographic

Company:	Yates Petroleum	Local Co-ordinate Reference:	Well #1H
Project:	Lea County, NM (NAD-83)	TVD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Site:	Mango BRM State	MD Reference:	RKB @ 3703.5usft (Nomac #22 KB=21.5')
Well:	#1H	North Reference:	Grid
Wellbore:	ST1	Survey Calculation Method:	Minimum Curvature
Design:	ST1	Database:	Houston R5000 Database

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,065.0	89.20	185.30	10,630.1	-3,649.4	-221.5	561,728.62	814,449.22	32° 32' 28.054 N	103° 26' 49.431 W
14,158.0	89.00	184.10	10,631.6	-3,742.1	-229.1	561,635.95	814,441.60	32° 32' 27.138 N	103° 26' 49.529 W
14,252.0	89.40	183.90	10,632.9	-3,835.9	-235.7	561,542.18	814,435.04	32° 32' 26.210 N	103° 26' 49.615 W
14,346.0	89.90	184.10	10,633.5	-3,929.6	-242.2	561,448.42	814,428.49	32° 32' 25.283 N	103° 26' 49.700 W
14,440.0	89.90	183.90	10,633.6	-4,023.4	-248.8	561,354.64	814,421.93	32° 32' 24.356 N	103° 26' 49.786 W
14,534.0	89.70	182.80	10,634.0	-4,117.2	-254.3	561,260.81	814,416.44	32° 32' 23.428 N	103° 26' 49.859 W
14,628.0	90.10	182.10	10,634.1	-4,211.1	-258.3	561,166.89	814,412.42	32° 32' 22.499 N	103° 26' 49.916 W
14,722.0	90.10	182.80	10,634.0	-4,305.1	-262.3	561,072.98	814,408.40	32° 32' 21.570 N	103° 26' 49.972 W
14,815.0	90.30	183.40	10,633.6	-4,397.9	-267.4	560,980.12	814,403.37	32° 32' 20.652 N	103° 26' 50.039 W
14,909.0	89.40	182.10	10,633.9	-4,491.8	-271.9	560,886.23	814,398.86	32° 32' 19.723 N	103° 26' 50.101 W
15,003.0	89.40	182.50	10,634.9	-4,585.7	-275.6	560,792.31	814,395.09	32° 32' 18.794 N	103° 26' 50.154 W
15,096.0	89.40	182.30	10,635.8	-4,678.6	-279.5	560,699.40	814,391.20	32° 32' 17.875 N	103° 26' 50.209 W
15,189.0	89.40	182.70	10,636.8	-4,771.5	-283.6	560,606.49	814,387.14	32° 32' 16.956 N	103° 26' 50.265 W
15,220.0	89.40	182.70	10,637.1	-4,802.5	-285.0	560,575.53	814,385.68	32° 32' 16.650 N	103° 26' 50.285 W
Final MWD Survey: 15220.0' MD, 10637.1' TVD, -4802.5' +N/-S, -285.0' +E/-W									
15,276.0	89.40	182.70	10,637.7	-4,858.4	-287.7	560,519.59	814,383.04	32° 32' 16.097 N	103° 26' 50.322 W
BHL: 15276.0' MD, 10637.7' TVD, 89.40° INC, 182.70° AZ, -4858.4' +N/-S, -287.7' +E/-W, 4867.0' VS - TD: 15276.0' MD, 10637.7' TVD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
10,112.0	10,110.9	-4.7	27.6	KOP: 10112.0' MD, 10110.9' TVD	
10,623.6	10,538.5	-230.3	-41.2	Cross 330' Hardline: 10623.6' MD, 10538.5' TVD, 58.76° INC	
10,982.0	10,623.9	-570.7	-74.2	EOC: 10982.0' MD, 10623.9' TVD, 91.00° INC, 181.80° AZ, 574.1' VS	
15,220.0	10,637.1	-4,802.5	-285.0	Final MWD Survey: 15220.0' MD, 10637.1' TVD, -4802.5' +N/-S, -285.0' +E/-W	
15,276.0	10,637.7	-4,858.4	-287.7	BHL: 15276.0' MD, 10637.7' TVD, 89.40° INC, 182.70° AZ, -4858.4' +N/-S, -287	
15,276.0	10,637.7	-4,858.4	-287.7	TD: 15276.0' MD, 10637.7' TVD	

Checked By: _____ Approved By: _____ Date: _____



Job Number: SVMO-140874
 Company: Yates Petroleum Corporation
 Lease/Well: Mango BRM State 1H
 Location: Lea County, NM
 Rig Name: Nomac #22
 RKB: 21.5'
 G.L. or M.S.L.: GL

State/Country: New Mexico/USA
 Declination: 6.71°
 Grid: East To Grid North
 File name: Y:\WINSER~1\2014SU~1\YATES\MO\MANGOB~1\1H.SVY
 Date/Time: 01-Jul-14 / 09:28
 Curve Name: Surface - 5800' M.D. (Rate Gyro)

MS Survey

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method
 Vertical Section Plane 183.32
 Vertical Section Referenced to Wellhead
 Rectangular Coordinates Referenced to Wellhead

We hereby certify that our survey data from
Surface MD to 5800 MD is, to the best of
 our knowledge a true and accurate account of the
 well bore.

Travis Pack
 MS Energy Services

7/1/14
 Date

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
200.00	1.46	139.86	199.98	-1.95	1.64	1.85	2.55	139.86	.73
400.00	1.22	135.18	399.92	-5.41	4.79	5.12	7.22	138.48	.13
600.00	.65	119.46	599.90	-7.47	7.27	7.04	10.43	135.78	.31
800.00	.27	157.47	799.89	-8.47	8.44	7.96	11.96	135.08	.23
1000.00	.35	203.38	999.89	-9.46	8.38	8.96	12.64	138.47	.13
1200.00	.28	98.70	1199.89	-10.10	8.62	9.58	13.28	139.51	.25
1400.00	.31	16.02	1399.88	-9.65	9.25	9.10	13.37	136.21	.20
1600.00	.32	76.84	1599.88	-9.00	9.95	8.41	13.42	132.15	.16
1800.00	.25	184.73	1799.88	-9.31	10.46	8.69	14.00	131.69	.23

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
2000.00	.32	63.54	1999.88	-9.50	10.92	8.85	14.47	131.02	.25
2200.00	1.06	95.12	2199.86	-9.41	13.26	8.63	16.26	125.37	.40
2400.00	.95	102.03	2399.83	-9.93	16.73	8.94	19.45	120.69	.08
2600.00	1.15	88.16	2599.80	-10.21	20.35	9.01	22.77	116.63	.16
2800.00	1.26	92.94	2799.75	-10.25	24.56	8.82	26.61	112.67	.07
3000.00	1.87	91.08	2999.68	-10.43	30.01	8.67	31.77	109.16	.31
3200.00	2.06	79.67	3199.56	-9.85	36.81	7.70	38.11	104.97	.22
3400.00	1.37	54.10	3399.47	-7.80	42.29	5.34	43.00	100.45	.51
3600.00	.95	55.42	3599.43	-5.46	45.59	2.81	45.91	96.83	.21
3800.00	.96	75.44	3799.41	-4.09	48.57	1.27	48.75	94.82	.17
4000.00	1.02	24.22	3999.38	-2.05	50.93	-.90	50.97	92.30	.43
4200.00	1.04	27.30	4199.35	1.19	52.49	-4.22	52.50	88.70	.03
4400.00	.51	9.62	4399.33	3.68	53.47	-6.77	53.60	86.07	.29
4600.00	.75	349.29	4599.32	5.84	53.38	-8.92	53.69	83.75	.16
4800.00	.76	354.07	4799.30	8.45	53.00	-11.50	53.66	80.94	.03
5000.00	.60	26.43	4999.29	10.70	53.32	-13.77	54.39	78.65	.20
5200.00	.81	348.59	5199.27	13.03	53.51	-16.10	55.07	76.32	.25
5400.00	.67	333.34	5399.25	15.46	52.71	-18.48	54.93	73.65	.12
5600.00	.67	330.83	5599.24	17.52	51.61	-20.48	54.51	71.25	.01
Last Survey Depth Recorded									
5800.00	.36	5.68	5799.23	19.17	51.10	-22.10	54.58	69.44	.21